



# NCDOT's Strategic Energy & Water Plan

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# Marching Orders

- **G.S. 143-64.10-16 Energy Conservation in Public Facilities- revised Apr. 2001**
  - “The state shall take a leadership role in aggressively undertaking energy conservation in North Carolina”
- **July 2002 letter from Governor Easley to Council of State and Cabinet**
  - “give this (Utility Savings) initiative a high priority in your organization.”

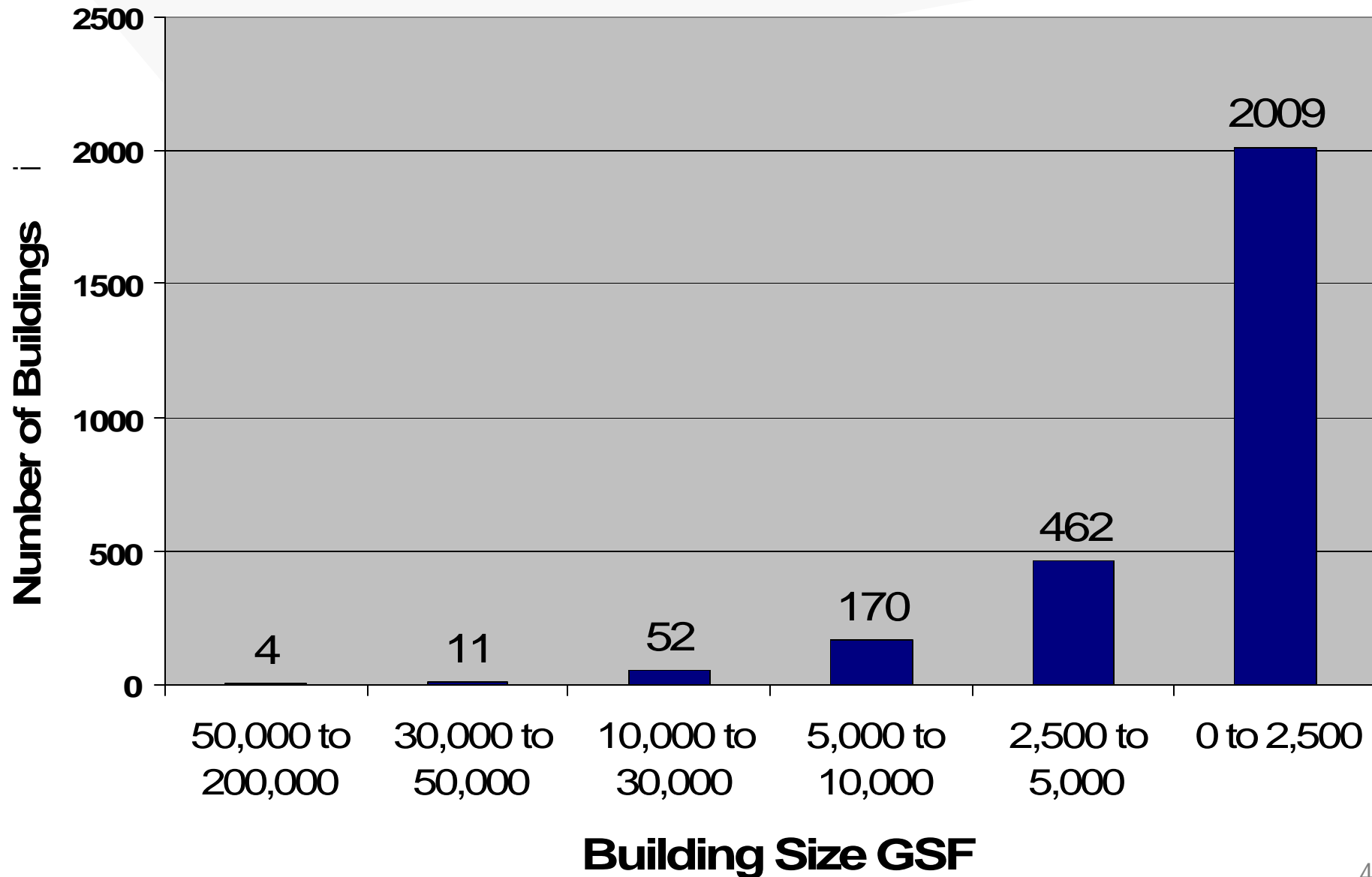


# DOT Energy & Water Usage

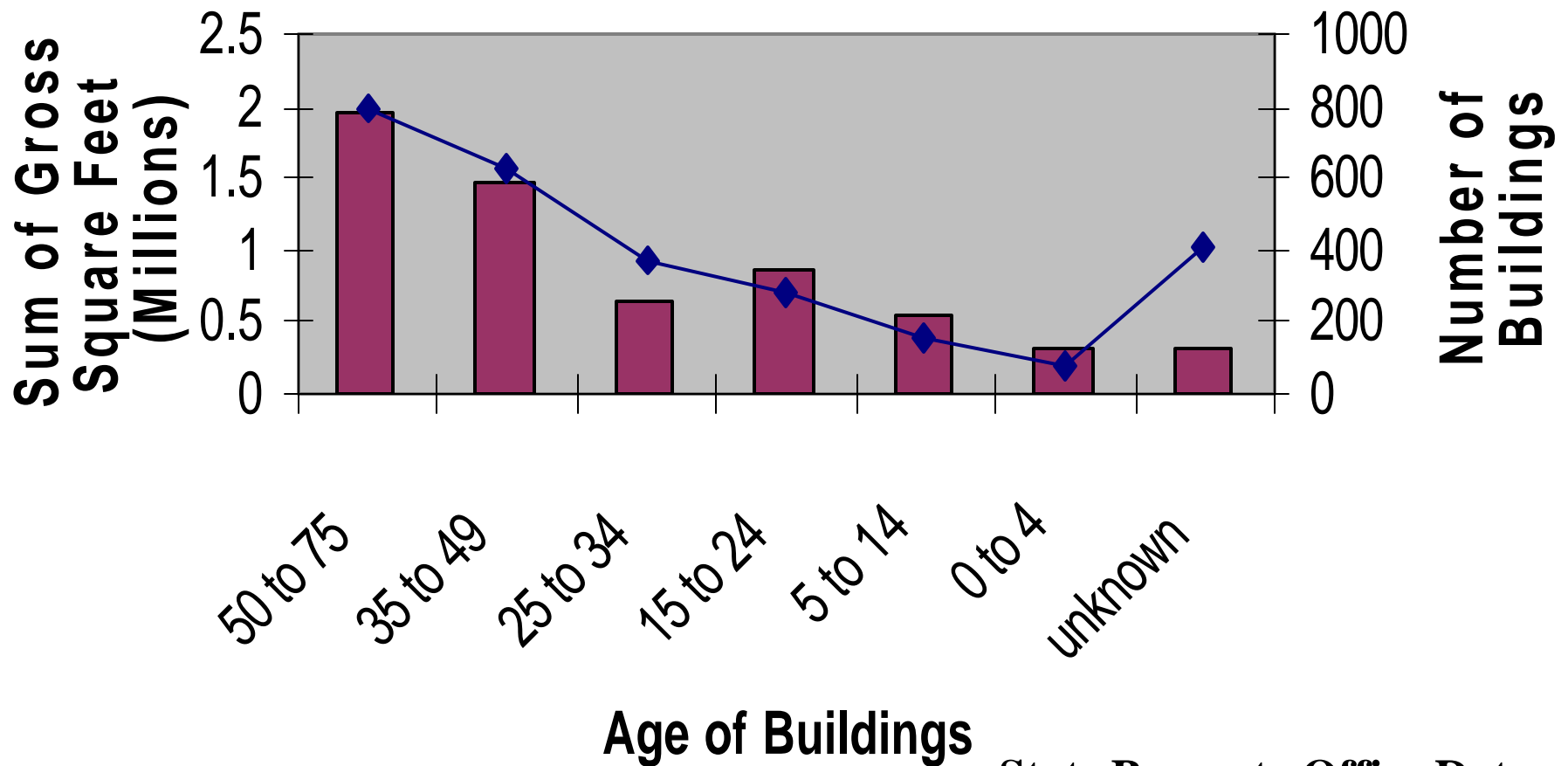
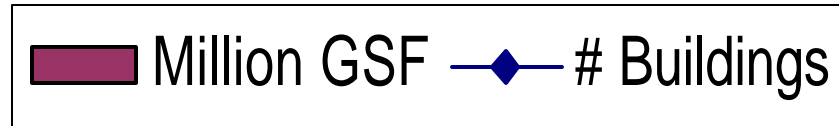
- \$14.5 Million per year for energy and water/sewer FY 05-06
- 14,000 employees
- approximately \$1,000 per employee
- 2,700+ buildings
- Use avoided utility costs to fund other operations & maintenance needs
- Opportunities for savings



# Building Inventory: Size (Gross Sq. Ft.)



# DOT Building Inventory: Age



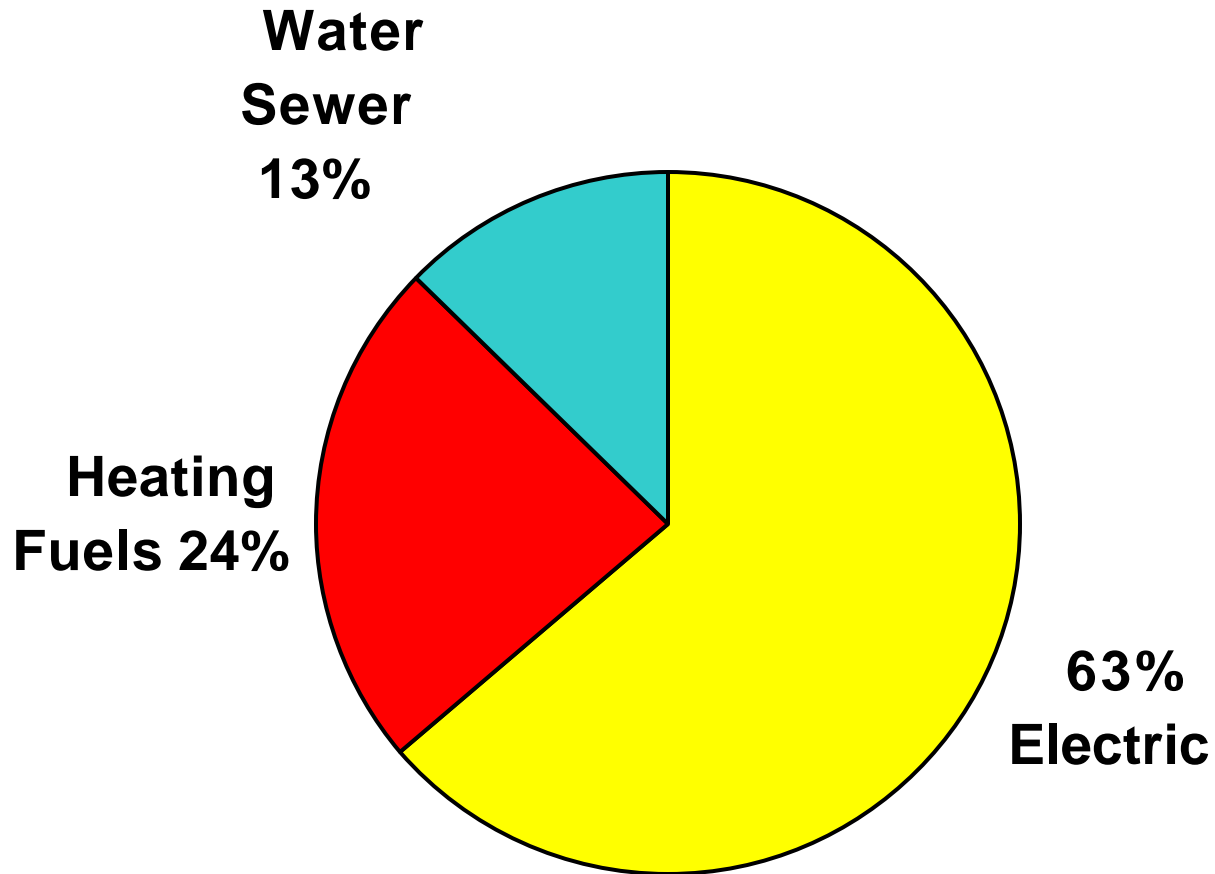
State Property Office Data

# DOT Strategic Energy Plan



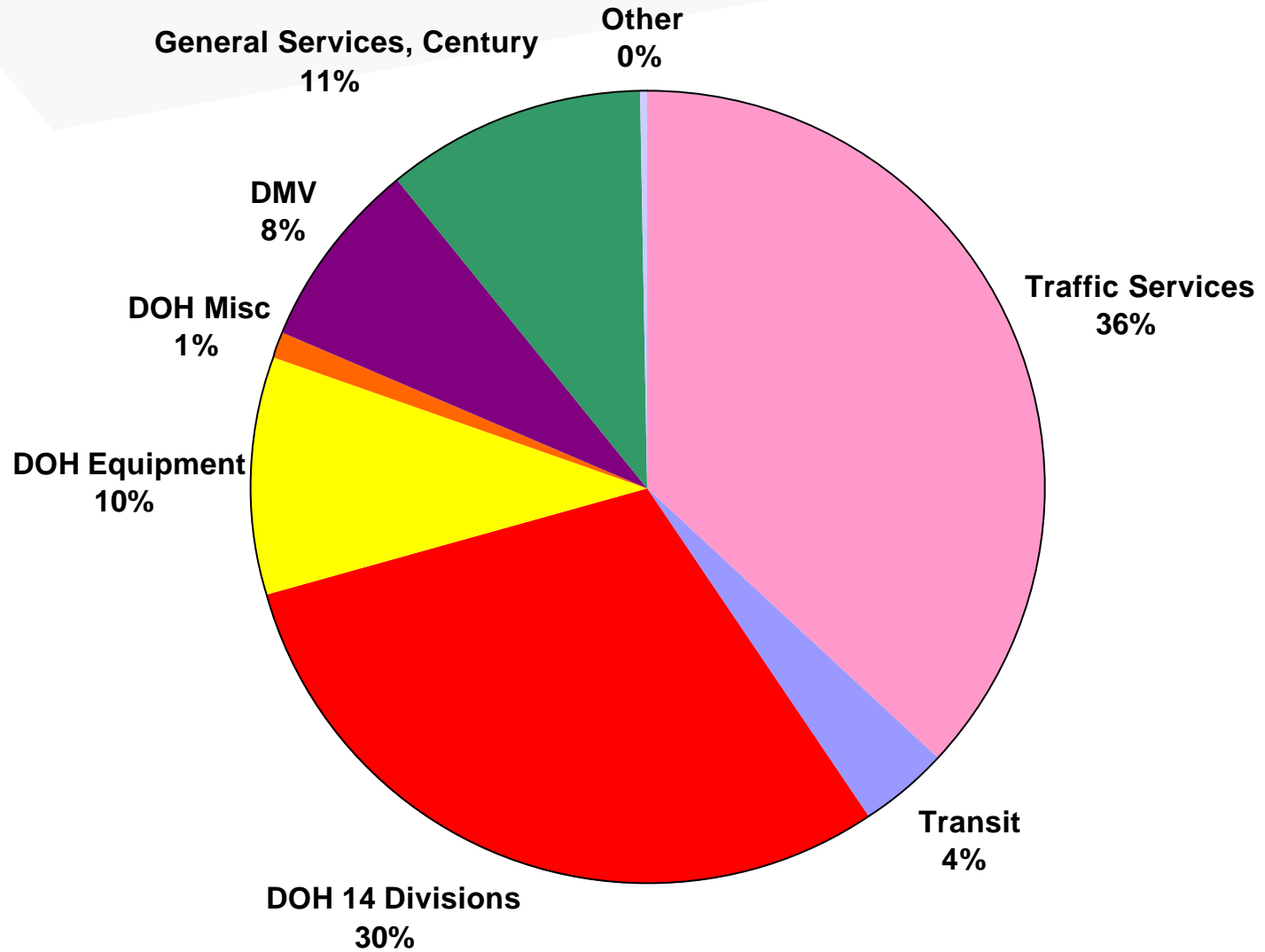
- **Strategic Energy Plan Mandate signed 2003 by Secretary Tippet to reduce energy 20% over five years**
- **Energy Management Engineer position established to implement efficiency program**
- **Team effort: Management, Facilities Design, Operations & Maintenance, Public Information, Waste Management, Fiscal, IT, Environmental Quality, *Employees***
- **Plan and report annual update October 1st to State Energy Office and NCDOT**

## **DOT Utility Costs FY 2005-06**



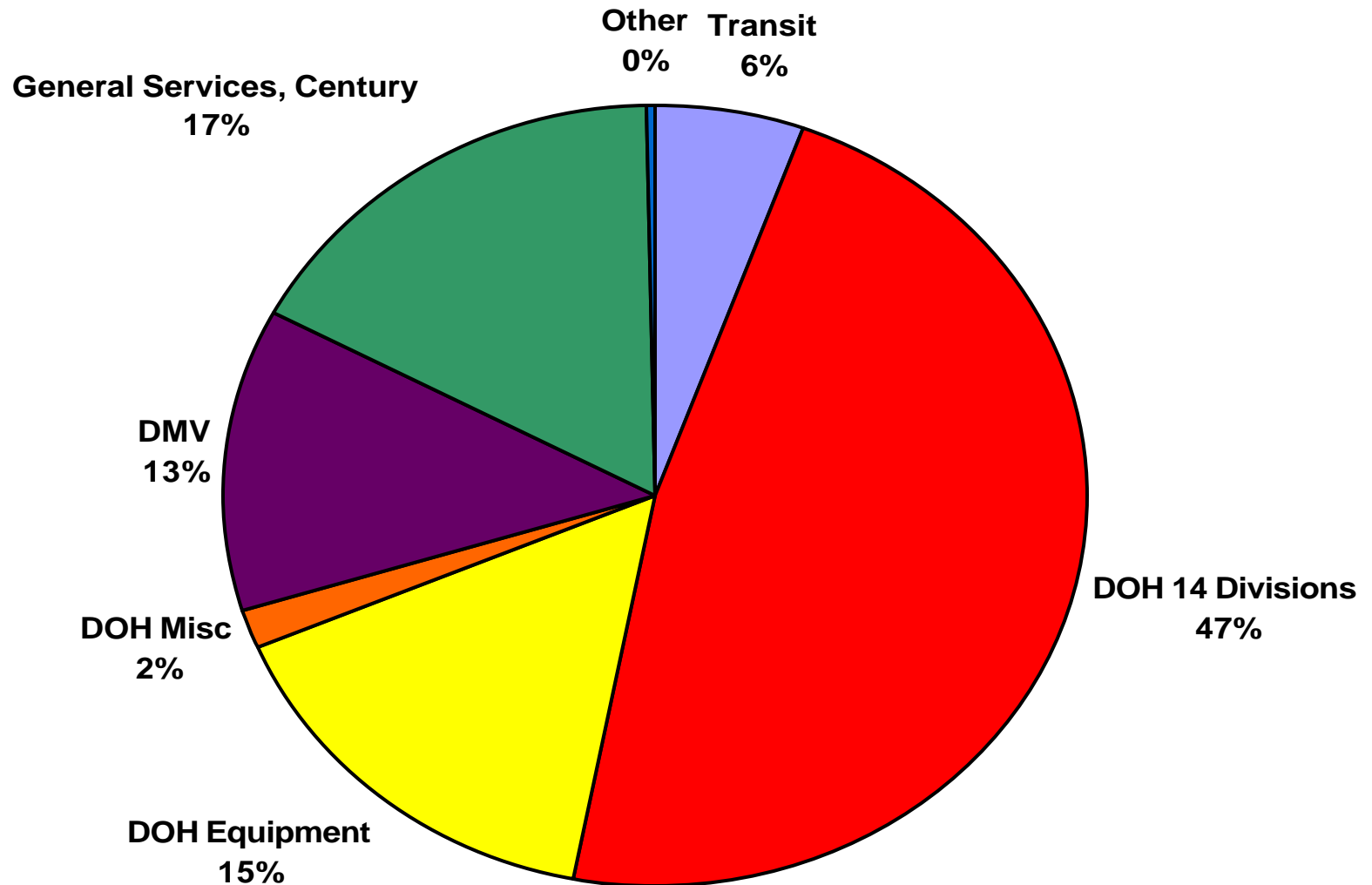
# DOT Total Utilities \$13.5 Million

## Electric, Nat. Gas, Water





**DOT Buildings \$8.5 Million**  
**Electric, Nat. Gas, Water**



# How much is 20% goal?

Annual  
energy  
& water  
avoided  
costs if  
energy  
reduced  
by 20%  
& water  
by 10%  
over 5  
years

Building energy and water costs =  
\$9.5 million (not Traffic Services)

Total energy cost = \$8.2 million

Reducing energy/sf by 20%,

Avoided energy cost = **\$1,805,894**

+ Save 10% water costs = **\$128,542**

**Goal (Avoided Costs) = \$1,934,436**

Annual avoided costs = \$386,887

# Avoided costs: cumulative effect

**Assumes uniform annual energy and water reductions and no increase in unit costs.**

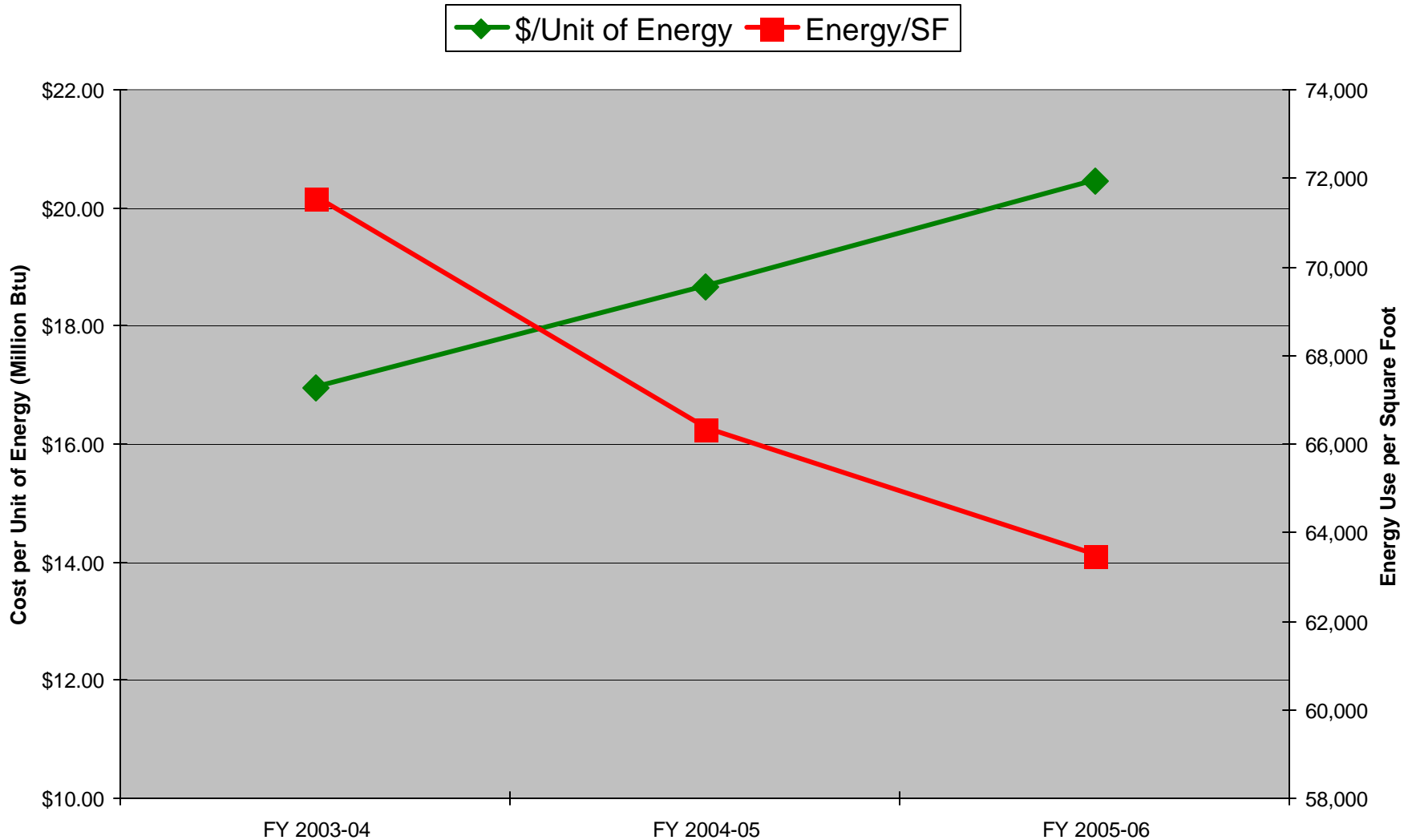
Yr 1	\$386,887
Yr 2	\$773,774
Yr 3	\$1,160,661
Yr 4	\$1,547,548
Yr 5	\$1,934,435

Energy savings through efficiency gains in **Year 1** results in avoided costs every year thereafter. Total 5 year cumulative =  
**\$5.8 million avoided**

# Progress from FY 03-04 Baseline

<b>COSTS</b>	<b>ENERGY \$/SF</b>	<b>\$/Million BTU</b>	<b>\$/MMBTU % Change</b>
<b>FY 2003-04</b>	<b>\$1.21</b>	<b>\$16.95</b>	
<b>FY 2004-05</b>	<b>\$1.24</b>	<b>\$18.65</b>	<b>10.0%</b>
<b>FY 2005-06</b>	<b>\$1.30</b>	<b>\$20.44</b>	<b>20.6%</b>
<b>ENERGY</b>	<b>BTU/SF</b>	<b>BTU/SF % Change</b>	<b>ENERGY \$ AVOIDED</b>
<b>FY 2003-04</b>	<b>71,535</b>		
<b>FY 2004-05</b>	<b>66,336</b>	<b>-7.3%</b>	<b>\$591,218</b>
<b>FY 2005-06</b>	<b>63,463</b>	<b>-11.3%</b>	<b>\$1,018,895</b>

# Energy Cost and Usage Trends



# Action Plan: Three-Way Approach

- Accounting: 1-2% Cost Reduction
  - Utility bills matched to building data
  - Benchmarks, Metrics (\$ per sf)
  - Optimize Rates
- Buildings: 12-15% Usage Reduction
  - Operations, Maintenance, Design
- People: 5-10% Usage Reduction
  - Communication, Education, Organizational Culture



# Accounting and Data Management

**PLAN**

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- *Review of utility bills and accounts by Fiscal and Business Officers*
- *Refund of \$26,000 from Airport Authority*
- *Refunds in progress of \$30,000 for closed accounts on leased buildings*
- *Spot water leaks: refund of \$14,000 from municipal water*
- *New SAP Maintenance and Utility Module for prioritizing building energy improvements*

# Plan in Action : Buildings

- *Lighting from T-12 magnetic ballast to T-8 electronic ballast with dual switches*
- *Programmable thermostats in DMV offices for night and weekend setback*
- *Higher efficiency replacement air conditioners*
- *New buildings meet or exceed energy code*
- *Vending machine lights out in lighted areas*
- *Power off computer monitors*
- *Compact fluorescent lamps "Change a Light"*



# Plan in Action : People

- *Contest for “Catchy Phrase” to encourage energy efficiency for DOT*
- *“Turn it off” stickers and posters*
- *“In The Loop” articles and tips*
- *Portal link for DOT energy information*
- *Post annual Strategic Energy Plan*
- *Promote CPI Awards and Best Practices*
- *Meeting agendas*
- *New employee orientation*

# Assistance Available

- Energy surveys of selected buildings
- Utility expenditure reports
- Coming Soon: Division reports ranking energy usage/sf, Cost/sf from SAP
- Prioritize buildings for improvements
- Reviewing bills for active accounts-closing old accounts (refunds!), better rates (time-of-use)
- Equipment energy evaluations





# Contact Information



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